

Patent Claims

1. A heat exchanger, in particular for a motor vehicle, having a heat exchanger block (11) which has 5 pipes (9) through which a first medium can flow on the primary side, and pipes (9) around which a second medium can flow on the secondary side, said pipes (9) having flow ducts (45) and pipe ends (9a, 9b), at least one end piece (3, 8) which holds the pipe ends (9a, 9b) 10 and each have at least one base plate (12, 13), diverter plate (14, 15) and cover plate (16, 17) as well as at least one inlet chamber (4) and/or outlet chamber (5) which is connected to one, or in each case to one, end piece (3, 8), it being possible to conduct 15 the first medium from the inlet chamber (4) to the outlet chamber (5) through the flow ducts (45), and with a housing casing (2) which surrounds the pipes (9) and has an inlet (6) and an outlet (7) for the second medium.
- 20 2. The heat exchanger as claimed in claim 1, characterized in that the pipes are embodied in particular as extruded flat pipes.
- 25 3. The heat exchanger as claimed in one of the preceding claims, characterized in that the pipes each have a plurality of flow ducts.
- 30 4. The heat exchanger as claimed in one of the preceding claims, characterized in that the heat exchanger block has at least two end pieces.
- 35 5. The heat exchanger as claimed in one of the preceding claims, characterized in that the housing casing is arranged between two end pieces.
6. The heat exchanger as claimed in one of the preceding claims, characterized in that at least two

plates of an end piece are embodied in an integral fashion.

5 7. The heat exchanger as claimed in one of the preceding claims, characterized in that the housing casing (2) is embodied as a single-part or multipart sheet-metal casing.

10 8. The heat exchanger as claimed in one of the preceding claims, characterized in that the housing casing (2) is connected in a materially joined fashion, in particular soldered, to the at least one end piece (3, 8).

15 9. The heat exchanger as claimed in one of the preceding claims, characterized in that the housing casing (2) has an essentially rectangular cross section with four sides (2a, 2b, 2c, 2d).

20 10. The heat exchanger as claimed in one of the preceding claims, characterized in that the inlet (6) and the outlet (7) are arranged on opposite sides (2a, 2c) of the housing casing (2).

25 11. The heat exchanger as claimed in one of the preceding claims, characterized in that the inlet (6) and the outlet (7) are arranged on the same side (2a) of the housing casing (2).

30 12. The heat exchanger as claimed in one of the preceding claims, characterized in that the inlet (6) and the outlet (7) are arranged at opposite ends of the housing casing (2).

35 13. The heat exchanger as claimed in one of the preceding claims, characterized in that distributor and collector chambers (28, 29) are formed in the housing

casing (2) in the region of the inlet (6) and outlet (7).

5 14. The heat exchanger as claimed in one of the preceding claims, characterized in that corrugated pieces of sheet metal (10) with longitudinal ducts (10a) are arranged between the pipes (9).

10 15. The heat exchanger as claimed in claim 14, characterized in that the corrugated pieces of sheet metal (10) have a longitudinal extent which corresponds to the distance between the inlet (6) and outlet (7).

15 16. The heat exchanger as claimed in one of the preceding claims, characterized in that the corrugated pieces of sheet metal (34) are embodied in a rectangular shape and leave an approximately rectangular inflow and outflow region (35, 36) between the pipes (9).

20 17. The heat exchanger as claimed in one of the preceding claims, characterized in that the corrugated pieces of sheet metal (10) are embodied in the form of a parallelogram and leave approximately triangular or 25 trapezoidal inflow and outflow regions (30, 31) between the pipes (9).

30 18. The heat exchanger as claimed in one of the preceding claims, characterized in that the inlet (6) and the outlet (7) are arranged opposite one another, and in that a dividing wall (39) is left between the inlet (6) and outlet (7) in order to form an inflow region (40) and an outflow region (41), and a diverter section (43) is left at the end of the housing casing 35 facing away from the inlet (6) and outlet (7), and in that the housing casing can be configured for at least a dual flow in the longitudinal direction (P1, P3) on the secondary side.

19. The heat exchanger as claimed in one of the preceding claims, characterized in that the second medium is guided essentially transversely with respect to the longitudinal direction of the pipes through the block (47).

20. The heat exchanger as claimed in claim 19, characterized in that the second medium can be diverted at least once in the longitudinal direction, and the heat exchanger block (60) can be configured for at least dual flow.

21. The heat exchanger as claimed in one of the preceding claims, characterized in that the housing casing (56) with the pipes and the block (47) forms an inlet chamber (57) and an outlet chamber (58) for the second medium, which chambers (57, 58) extend in the longitudinal direction of the pipes.

22. The heat exchanger as claimed in claim 21, characterized in that inlet and outlet ducts (53, 54) for the second medium are arranged at the end pieces (48, 51), said inlet and outlet ducts (53, 54) communicating with the inlet and outlet chambers (57, 58).

23. The heat exchanger as claimed in one of the preceding claims, characterized in that at least one diversion box (63, 64) is arranged in the housing casing, and at least one transversely extending dividing wall (61, 62) is arranged between the pipes.

24. The heat exchanger as claimed in one of the preceding claims, characterized in that corrugated ribs or turbulence inserts which form transverse ducts for the second medium are arranged between the pipes.

25. The heat exchanger as claimed in one of the preceding claims, characterized in that the heat exchanger block (11) is configured for a single flow on the primary side.

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26. The heat exchanger as claimed in one of the preceding claims, characterized in that the heat exchanger block (11, 47) can be configured for a dual flow or more on the primary side.

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27. The heat exchanger as claimed in one of the preceding claims, characterized in that the first medium is a refrigerant which can be operated in particular in dual phase or supercritically.

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28. The heat exchanger as claimed in one of the preceding claims, characterized in that the second medium is a fluid, and in particular a fluid coolant.